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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,562	12/30/2003	Gregory P. Crawford	59067US002	8039

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EXAMINER	
CHEN, WEN YING PATTY	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 05/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/748,562	CRAWFORD ET AL.	
	Examiner	Art Unit	
	Wen-Ying P. Chen	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) *3,6-9,27-30,32,33,35-37,39,40 and 42-53* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,5,10-26,31,34,38 and 41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's Amendment filed Mar. 13, 2006 has been received and entered. Claims 1-53 remain pending in the current application and claims 3, 6-9, 27-30, 32-33, 35-37, 39-40 and 42-53 are withdrawn from consideration.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 4-5, 11-15, 18, 20, 22-23, 25-26, 31, 34 and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Gibbons et al. (US 6242061).

With respect to claim 1: Gibbons et al. disclose in Column 9 line 51 to Column 11 line 38 a method, comprising:

exposing an alignment material to an interference pattern to cause a chemical reaction in the alignment material; and

exposing the alignment material to a liquid crystal,

wherein the liquid crystal aligns relative to the alignment material based on the interference pattern .

As to claim 2: Gibbons et al. further disclose in Column 2 lines 12-17 that the chemical reaction causes polymerization in the alignment material.

As to claim 4: Gibbons et al. further disclose in Column 2 lines 12-17 that the chemical reaction comprises a photochemical reaction.

As to claim 5:. Gibbons et al. further disclose in Column 9 line 51 to Column 10 line 49 that a surface of the alignment material is exposed to the interference pattern.

As to claim 11: Gibbons et al. further disclose in Figure 2 that the alignment material (element 14) is disposed on a surface of a substrate (element 12) comprising a substrate material.

As to claim 12: Gibbons et al. further disclose in Column 12 lines 27-31 and Column 21 lines 11-12 that the substrate material is at least one of a glass, a polymer, a metal and a semi-conductor.

As to claim 13: Gibbons et al. further disclose in Figure 2 that the substrate comprises an electrode layer (element 13).

As to claim 14: Gibbons et al. further disclose in Column 11 line 44 that the electrode layer comprises a transparent electrically conductive material.

As to claim 15: Gibbons et al. further disclose in Column 11 lines 56-58 that the substrate comprises a thin film transistor.

As to claim 18: Gibbons et al. further disclose in Column 9 lines 22-31 that the alignment material comprises a polymer.

As to claim 20: Gibbons et al. further disclose in Column 9 lines 22-31 that the polymer is a polyimide.

As to claim 22: Gibbons et al. further disclose in Figure 1 that the interference pattern is formed from two or more optical beams, which originate from the same source.

As to claim 23: Gibbons et al. further disclose in Column 3 lines 19-20 that the optical beams comprise UV radiation.

As to claims 25 and 26: Gibbons et al. further disclose in Column 10 line 17 to Column 11 line 38 that the interference pattern comprises regions of high intensity and regions of low intensity and that the liquid crystal aligns relative to the alignment material based on the intensity of the interference pattern.

As to claim 31: Gibbons et al. further disclose in Column 10 lines 13-23 that the interference pattern comprises regions of different polarization.

As to claim 34: Gibbons et al. further disclose in Column 10 line 13 to Column 11 line 38 that the liquid crystal aligns relative to the alignment material based on the polarization of the interference pattern.

As to claim 38: Gibbons et al. further disclose in Column 10 lines 17-19 that the interference pattern is formed by overlapping two or more beams.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbons et al. (US 6242061) in view of Yamada et al. (US 6067141).

With respect to claim 10: Gibbons et al. disclose all of the limitations set forth in the previous claims, but fail to disclose that the surface of the alignment material comprises a channel.

However, Yamada et al. disclose in Figure 3A an alignment layer (element 52), which comprises a channel.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use an alignment layer comprising of a channel as taught by Yamada et

al. when patterning the alignment layer using the method as taught by Gibbons et al., since Yamada et al. teach that the channels form multiple domains in the display region, wherein the liquid crystals can thus have randomized alignment directions and thus provide a liquid crystal display device which has an excellent all-direction viewing angle characteristic (Column 13, lines 53-59, Column 9, lines 4-7).

As to claim 21: Gibbons et al. disclose all of the limitations set forth in the previous claims, but fail to disclose that the alignment material comprises of silane.

However, Yamada et al. teach the use of silane on the alignment layer (Column 12, lines 7-14).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use silane on the alignment layer as taught by Yamada et al. and pattern the alignment layer with the method taught by Gibbons et al., since Yamada et al. teach that silane treatment of the alignment layer helps in fixating the alignment layer on the substrate (Column 12, lines 7-14).

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbons et al. (US 6242061) in view of Noh (US 5929957).

Gibbons et al. disclose all of the limitations set forth in claim 1, but fail to disclose that liquid crystal permeates the alignment material or that the alignment material comprises a liquid crystal.

However, Noh disclose in the Abstract a liquid crystal display device comprising an alignment layer wherein the alignment layer comprises liquid crystal and that the liquid crystal permeates the alignment layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern an alignment material as taught by Gibbons et al. wherein the alignment layer comprises liquid crystal and that the liquid crystal permeates the alignment layer as taught by Noh, since Noh teaches that such alignment layer enables liquid crystal orientation without utilizing a rubbing process (Column 1, lines 37-51).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbons et al. (US 6242061).

Gibbons et al. disclose all of the limitations set forth in claim 19, but the disclosed embodiment comprises of an alignment layer comprising a chromophore other than cinnamate esters and the like.

However, in the background art, Gibbons et al. teach in Column 2 lines 7-19 the use of a chromophore that comprise a cinnamate group.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern an alignment material as taught by Gibbons et al. wherein the alignment material comprises a polymer comprising a cinnamate group as discussed in the background art, since by using a chromophore comprising of a cinnamate group helps to establish the pre-tilt in the alignment layer (Column 2, lines 7-19).

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbons et al. (US 6242061) in view of Hirata et al. (US 5652634).

Gibbons et al. disclose all of the limitations set forth in claim 1, but fail to disclose that the interference pattern is formed from two or more electron beams.

However, Hirata et al. teach the use of electron beams for patterning an alignment layer (Column 25, lines 30-32).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern the alignment material with the method as taught by Gibbons et al. by using the electron beams for patterning as taught by Hirata et al., since Hirata et al. teach that electron beams are used to easily obtain high energy sufficient enough to change the orientation direction of the liquid crystal molecules (Column 25, lines 21-36).

Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbons et al. (US 6242061) in view of Kelsey et al. (US 2002/0169849).

Gibbons et al. disclose all of the limitations set forth in claim 1, but fail to disclose that the interference pattern is formed by overlapping three or more beams and at least two of the beam have similar polarization states.

However, Kelsey et al. disclose in Figure 6b the use of three laser light beams having at least two beams with similar polarization states, generated from the same laser source in forming the interference pattern.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to pattern the alignment material as taught by Gibbons et al. using the light

beam source configuration as taught by Kelsey et al., since the overlapping regions of the different light beams generate specific periodic structures on the surfaces, as taught by Kelsey et al. (Paragraph 0054).

Response to Arguments

Applicant's arguments, filed Mar. 13, 2006, with respect to the rejection(s) of claim(s) 1-2, 4-5, 10-26, 31, 34, 38 and 41 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the newly found references in the rejections as set forth in the Office Action above.

Relevant Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Amako et al. (JP 08-095045); exposing an orientation film with interference patterns.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wen-Ying P. Chen whose telephone number is (571)272-8444. The examiner can normally be reached on 8:00-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Wen-Ying P Chen
Examiner
Art Unit 2871

WPC
5/08/06

ANDREW SCHECHTER
PRIMARY EXAMINER